

**FARRAGUT VILLAGE PROPERTY ASSOCIATION, INC. (PWSNO 1280070)**  
**SOURCE WATER ASSESSMENT REPORT**

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**July 5, 2001**



**State of Idaho**  
**Department of Environmental Quality**

**Disclaimer:** This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on the data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the state of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Farragut Village Property Association, Inc.*, describes the public drinking water wells; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Farragut Village Property Association, Inc. drinking water is supplied by a single 450-foot deep well pumping from the Rathdrum Prairie Aquifer. The district serves a population of about 90 people in rural Kootenai County, Idaho, near Farragut State Park. Historically, Farragut Village Property Association, Inc. has had few water quality problems. A ground water Susceptibility Analysis conducted by DEQ July 5, 2001 found the wells to be at moderate risk for contamination, primarily because of natural risk factors associated with local geology.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Source water protection activities for Farragut Village Property Association, Inc. should incorporate a variety of strategies. The Association should continue to promote its back flow prevention program. Public education efforts regarding ground water protection should be aimed at school children, households and businesses in the service area. Partnerships with private landowners and public agencies that manage land over the well recharge zone are important because their activities potentially affect ground water quality.

Because 186 public water systems in Idaho draw water from the Rathdrum Prairie Aquifer, they should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

# **SOURCE WATER ASSESSMENT FOR FARRAGUT VILLAGE PROPERTY ASSOCIATION, INC.**

## **Section 1. Introduction - Basis for Assessment**

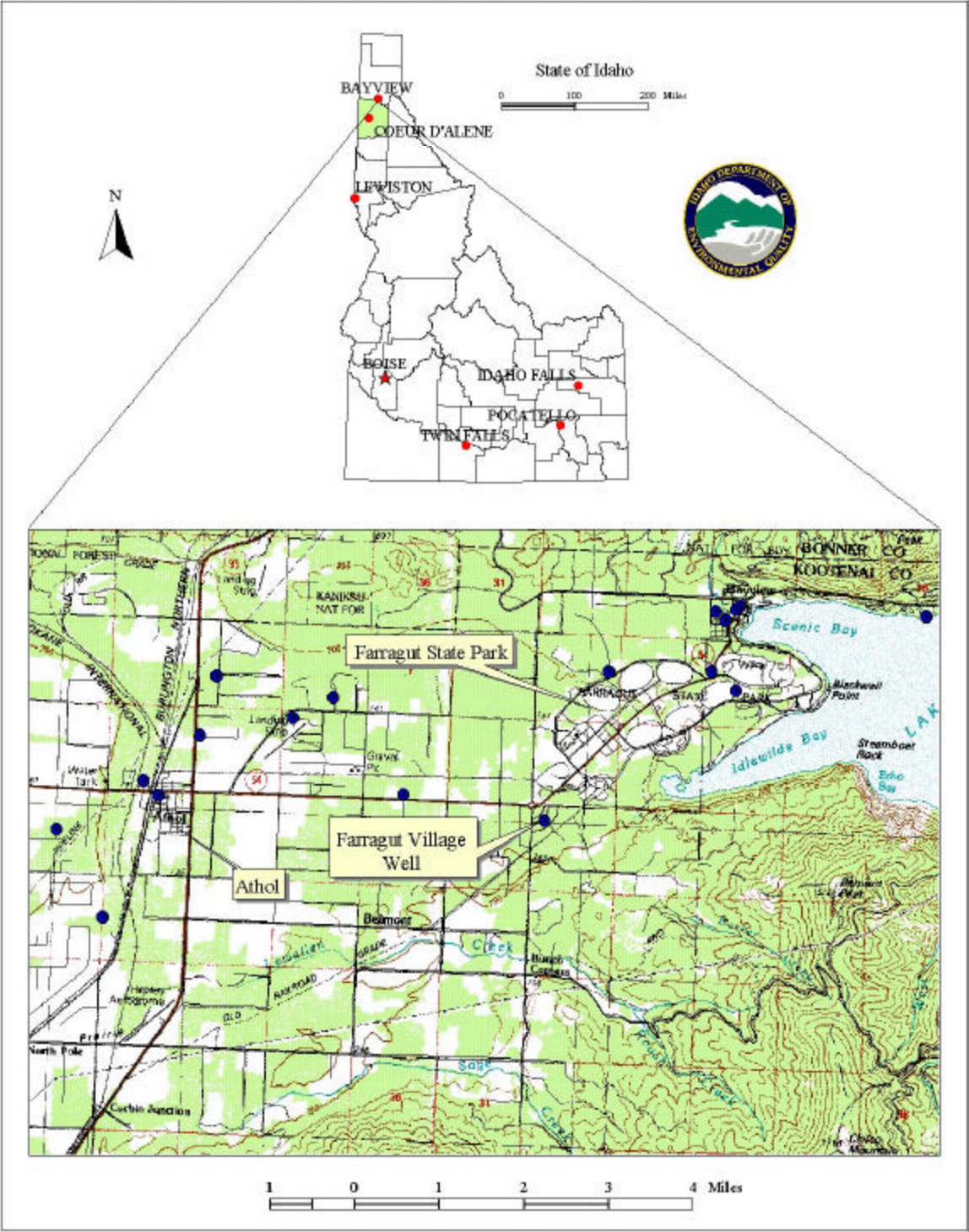
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water susceptibility analysis worksheets used to develop this assessment are attached.

### **Level of Accuracy and Purpose of the Assessment**

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

**The results of the source water assessment should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.** The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Farragut Village Property Association, Inc.



## Section 2. Preparing for the Assessment

### Defining the Zones of Contribution - Delineation

The delineation process establishes the physical area around a well that will become the focal point of the source water assessment. The process includes mapping the boundaries of the well recharge area into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well). DEQ used a refined computer model approved by the EPA to determine the time of travel (TOT) for water pumped from the Rathdrum Prairie Aquifer. The computer model used data assimilated by DEQ from a variety of sources including local well logs.

Farragut Village Property Association, Inc. serves a community of approximately 90 people located in the vicinity of Farragut State Park in Kootenai County, Idaho (Figure 1). Public drinking water for Farragut Village Property Association, Inc. customers is supplied from a 450 -foot deep well.

The delineated source water assessment area for Farragut Village Property Association, Inc. is a narrow corridor curving north and eastward for about 1.5 miles from the well to the edge of the aquifer at Buttonhook Bay on Lake Pend Oreille (Figure 2). The estimated time of travel from the aquifer boundary to the well is less than three years.

### Identifying Potential Sources of Contamination

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within the source water assessment areas through the use of computer databases and Geographic Information System maps developed by DEQ. Additional information about land use and ownership in the area around the Farragut Village well recharge zone was supplied in the report *Source Water Assessment for Farragut Village Property Association, Inc.* compiled by C. Dan Hinrichsen.

Figure 2, *Farragut Village Property Association, Inc. Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Farragut Village Property Association, Inc. well, and the zone of contribution DEQ delineated for it. Roads crossing the delineation boundaries appear to carry low volume local traffic. Homes in the area are on individual septic systems. The predominant land use in the recharge zone is undeveloped forest under private and state ownership.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

### **Section 3. Susceptibility Analysis**

The susceptibility to contamination of all ground water sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheet in Attachment A shows in detail how the Farragut Village Property Association, Inc. well scored.

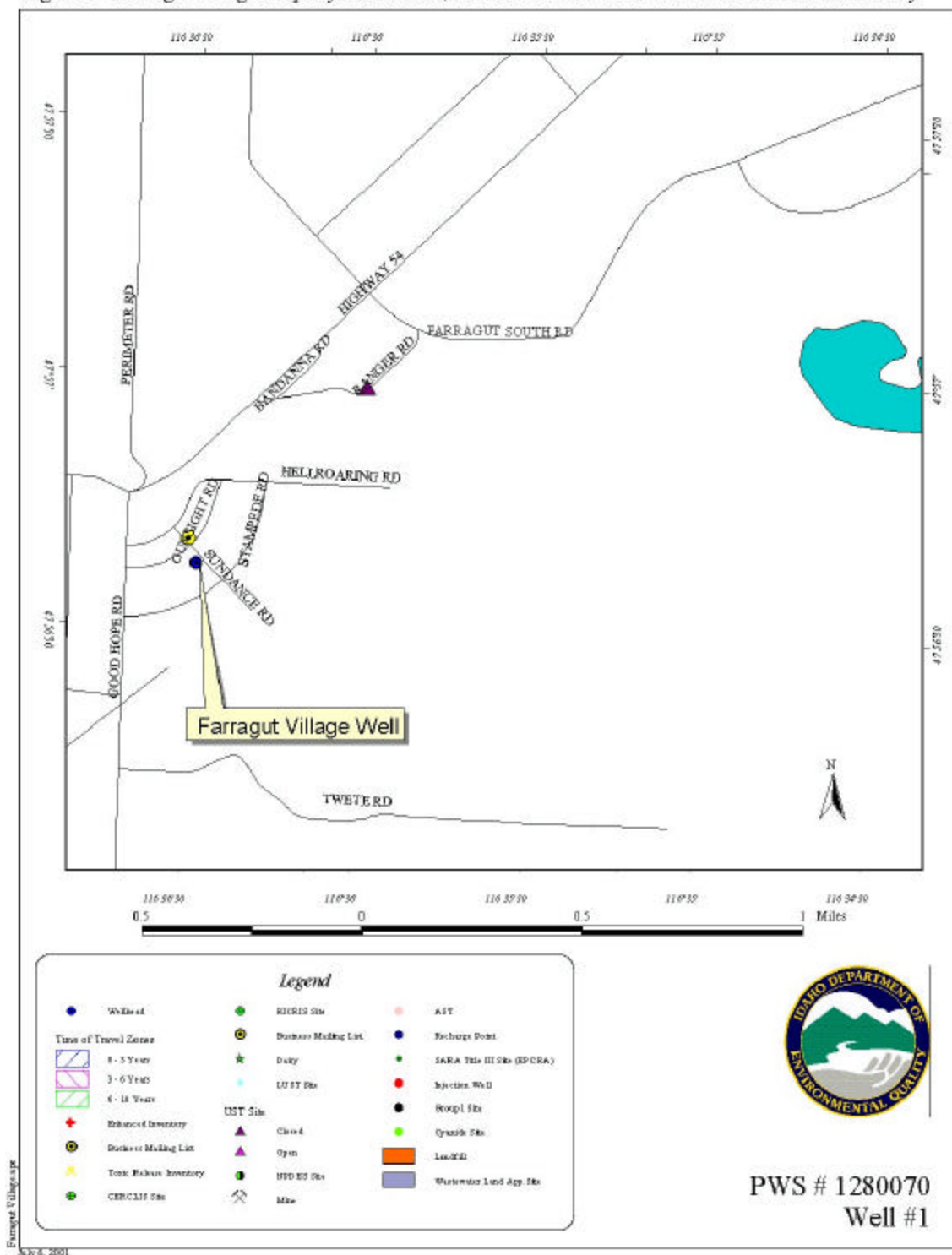
#### **Well Construction**

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the Susceptibility Analysis relies on information from individual well logs and from the most recent Sanitary Survey of the public water system. A copy of the Farragut Village Property Association, Inc. well log is on file with DEQ. The water system was surveyed January 24, 2000.

The Farragut Village Property Association, Inc. drinking water system relies on a single well extracting ground water for irrigation and domestic uses. No treatment is required before the water enters the distribution system. The January 24, 2000 Sanitary Survey notes that the system appears to be well run and the physical plant is well maintained. No deficiencies were observed during the inspection.

Except for a minor difference in the required wall thickness for a 10-inch casing, the well appears to meet current Idaho Department of Water Resources standards. The 10-inch casing for the well extends to a depth of 424.6 feet, with a further 10 feet of stainless steel well screen. The surface seal depth reported on the well log is 417 feet, but the hole diameter reduces from 16 inches to 10 inches at a depth of 46 feet. The seal and casing terminate in a sand and gravel soil stratum. The static water reported on the well log is 417 feet and the total well depth is 450 feet.

Figure 2. Farragut Village Property Association, Inc. Delineation and Potential Contaminant Inventory.



## **Hydrologic Sensitivity**

Hydrologic sensitivity scores reflect natural geologic conditions at the well site and in the recharge zone. This portion of the Susceptibility Analysis relies heavily on individual well logs. The soils drainage classification for the entire well recharge delineation is also taken into account.

The hydrologic sensitivity score for the Farragut Village Property Association, Inc. wells is 5 points out of 6 points possible. Soils in the well recharge zone as a whole are moderately well to well drained. These rapid draining soils are deemed less protective of ground water than, slow draining soils.

The well log reports boulders, sand, gravel and cemented gravel in the soil layers above the water table. The depth to ground water is greater than 300 feet, which provides some protection from potential contaminants through adsorption and other mechanisms. There is no aquitard with a cumulative thickness of 50 feet or more to retard vertical transport of contaminants.

## **Potential Contaminant Sources and Land Use**

Land use within The Farragut Village Property Association, Inc. well recharge zone is undeveloped forest and forested rural residential lots. Homes in the area are on individual septic systems. Roads near the well and crossing the delineation boundaries appear to carry a low volume of local traffic, with a low potential for spills from vehicles carrying septic pumpage or petroleum products.

The delineation for Farragut Property Association terminates at Buttonhook Bay where waters of Lake Pend Oreille recharge the Rathdrum Prairie Aquifer. A site inspection and review of the public water system records conducted in 1995 determined that the Farragut Village Water Association well is not directly influenced by surface water. Direct surface water influence is a high risk factor for microbial contamination. There are no major roads abutting the shore of the southern arm of Lake Pend Oreille, and no major drainages emptying into that portion of the lake, so the risk of a significant contaminant spill in the Idlewild Bay area is minimal.

## **Historic Water Quality**

Historically, Farragut Village Property Association, Inc. has had few water quality problems. The only two positive bacterial samples on record for the system were apparently due to sampling technique error. Nitrate concentrations have fluctuated from undetectable levels to 0.6 mg/l. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/l.

Synthetic organic compounds and volatile organic compounds have never been detected in the well. Radiological contaminants in concentrations far below MCL have been present since testing began in 1983. Elevated copper concentrations detected in some distribution system samples in 1993 and in 1995, were not present in samples tested later in 1995, in 1998 and 1999.



## Final Susceptibility Ranking

The Farragut Village Property Association, Inc. well ranked moderately susceptible to all classes of regulated contaminants because of risk factors associated with the geology of the Rathdrum Prairie Aquifer. Total scores in each category are summarized on Table 1. The complete analysis worksheet for the well can be found in Attachment A.

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

**Table 1. Summary of Farragut Village Property Association, Inc. Susceptibility Evaluation**

Cumulative Susceptibility Scores						
Well Name	System Construction	Hydrologic Sensitivity	Contaminant Inventory			
			IOC	VOC	SOC	Microbial
Well #1	3	5	0	0	0	0
Final Susceptibility Ranking						
	IOC	VOC	SOC	Microbial		
Well #1	Moderate	Moderate	Moderate	Moderate		

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

HIGH\* - Indicates source automatically scored as high susceptibility due to presence of bacteria or a VOC, SOC or an IOC above the maximum contaminant level in the tested drinking water

## Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. The state and local health districts have instituted enhanced protection of the ground water in the Rathdrum Prairie Aquifer because of its high use and uniquely pristine water quality. The protections are generally aquifer wide and are not aimed at zones of contribution to a specific well or water system measures.

The 186 public water systems in Idaho that draw water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. These types of measures could be used to protect the capture zones of a specific system or group of wells that could be put at risk from local land use changes.

In its own service area, Farragut Village Property Association, Inc. should continue to promote its back flow prevention program. The association can sponsor public education efforts pertaining to septic tank maintenance. Water users can be invited to participate in voluntary ground water protection activities like household hazardous materials collection days.

Partnerships with state and local agencies and industry groups should also be established. It is particularly important to make forest land owners aware that lands they manage overlies a well recharge zone so that timber management and harvest practices can be reviewed for potential effects on ground water. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

## **Assistance**

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office     (208) 769-1422

State IDEQ Office                                 (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 343-7001 for assistance with wellhead protection strategies.

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Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

## Attachment A

# Farragut Village Property Association, Inc. Susceptibility Analysis Worksheet

**Ground Water Susceptibility Analysis**

Public Water System Name : **FARRAGUT VILLAGE PROPERTY ASSN INC** Source: **WELL #1**  
 Public Water System Number : **1280070** 7/5/01 9:18:55 AM

<b>1. System Construction</b>		<b>SCORE</b>			
Drill Date	2/4/71				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES 2000				
Well meets IDWR construction standards	YES	0			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
<b>Total System Construction Score</b>		<b>3</b>			
<b>2. Hydrologic Sensitivity</b>					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	YES	0			
Aquitard present with > 50 feet cumulative thickness	NO	2			
<b>Total Hydrologic Score</b>		<b>5</b>			
<b>3. Potential Contaminant / Land Use - ZONE 1A (Sanitary Setback)</b>		IOC	VOC	SOC	Microbial
		Score	Score	Score	Score
Land Use Zone 1A	RANGELAND, WOODLAND	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
<b>Total Potential Contaminant Source/Land Use Score - Zone 1A</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Potential Contaminant / Land Use - ZONE 1B ( 3 YR. TOT)</b>					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
<b>Total Potential Contaminant Source / Land Use Score - Zone 1B</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Potential Contaminant / Land Use - ZONE II (6 YR. TOT)</b>					
Contaminant Sources Present					
Sources of Class II or III leacheable contaminants or Microbials					
Land Use Zone II					
<b>Potential Contaminant Source / Land Use Score - Zone II</b>					
<b>Potential Contaminant / Land Use - ZONE III (10 YR. TOT)</b>					
Contaminant Source Present					
Sources of Class II or III leacheable contaminants or Microbials					
Is there irrigated agricultural lands that occupy > 50% of Zone					
<b>Total Potential Contaminant Source / Land Use Score - Zone III</b>					
<b>Cumulative Potential Contaminant / Land Use Score</b>					
<b>4. Final Susceptibility Source Score</b>		<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>
<b>5. Final Well Ranking</b>		Moderate	Moderate	Moderate	Moderate

## POTENTIAL CONTAMINANT INVENTORY

### LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.